

What is claimed is:

1. A targeting moiety comprising a conjugate of an antibody linked to a ligand-binding region of a receptor subunit selected from the group consisting of interleukin-2 receptor  $\alpha$  (IL-2 $\alpha$ ), interleukin-4 receptor  $\alpha$  (IL-4 $\alpha$ ), and interleukin-15 receptor  $\alpha$  (IL-15R $\alpha$ ), which antibody is specific for a cell marker specific to a targeted cell.
2. A targeting moiety as claimed in claim 1, comprising a covalent conjugate in which the antibody is covalently linked to the ligand-binding region of the receptor.
3. A targeting moiety as claimed in claim 1, comprising a fusion protein of the antibody and the ligand-binding region.
4. A targeting moiety as claimed in claim 1, comprising a bispecific antibody that has a first specificity for a cell marker specific to a targeted cell and a second specificity for the ligand-binding region.
5. A targeting moiety as claimed in claim 1, wherein the antibody is specific to CEA.
6. A targeting moiety as claimed in claim 1, wherein the antibody is specific to HLA-DR.
7. A targeting moiety as claimed in claim 1, wherein the receptor subunit is IL-4 $\alpha$ .
8. A targeting moiety as claimed in claim 1, wherein the receptor subunit is IL-15R $\alpha$ .
9. A targeting moiety as claimed in claim 1, wherein the antibody is specific to HLA-DR and is linked to the ligand-binding region of IL-15R $\alpha$ .

10. A targeting moiety as claimed in claim 1, wherein the antibody is specific to CEA and is linked to the ligand-binding region of IL-15R $\alpha$ .

11. A targeting moiety as claimed in claim 1, wherein the antibody is specific to HLA-DR and is linked to the ligand-binding region of IL-4R $\alpha$ .

12. A targeting moiety as claimed in claim 1, wherein the antibody is specific to CEA and is linked to the ligand-binding region of IL-4R $\alpha$ .

13. A targeting moiety as claimed in claim 1, wherein the antibody is specific for a cell marker specific to a B-cell.

14. A targeting moiety as claimed in claim 1, wherein the antibody is specific for a cell marker specific to a malignant B-cell.

15. A targeting moiety as claimed in claim 1, wherein the antibody is specific for a cell marker specific to an activated B-cell.

16. A targeting moiety as claimed in claim 1, wherein the antibody is specific for a cell marker specific to a normal B-cell.

17. A targeting moiety as claimed in claim 1, wherein the antibody is specific for a cell marker specific to a T-cell.

18. A targeting moiety as claimed in claim 1, wherein the antibody is specific for a cell marker specific to a malignant T-cell.

19. A targeting moiety as claimed in claim 1, wherein the antibody is specific for a cell marker specific to an activated T-cell.

20. A composition comprising a targeting moiety according to claim 1, and a pharmaceutically acceptable carrier.

21. A composition comprising a targeting moiety according to claim 7, and a pharmaceutically acceptable carrier.

22. A composition comprising a targeting moiety according to claim 8, and a pharmaceutically acceptable carrier.

23. A kit comprising a conjugate of IL-15 linked to a drug, radionuclide or toxin, and a targeting moiety comprising an antibody specific for a cell marker specific to a targeted cell, linked to the ligand-binding region of IL-15R $\alpha$ .

24. A kit as claimed in claim 23, wherein the antibody is specific for a cell marker specific to a B-cell.

25. A kit as claimed in claim 23, wherein the antibody is specific for a cell marker specific to a malignant B-cell.

26. A kit as claimed in claim 23, wherein the antibody is specific for a cell marker specific to an activated B-cell.

27. A kit as claimed in claim 23, wherein the antibody is specific for a cell marker specific to a normal B-cell.

28. A kit as claimed in claim 23, wherein the antibody is specific for a cell marker specific to a T-cell.

29. A kit as claimed in claim 23, wherein the antibody is specific for a cell marker specific to a malignant T-cell.

30. A method of treatment for cancer or an immunologically-mediated or infectious disease, comprising:

first administering to a subject in need of such treatment a targeting moiety comprising a antibody specific for a cell marker specific to a targeted cell, linked to the ligand-binding region of IL-15R $\alpha$ , and then

administering to the subject a therapeutically effective amount of a conjugate of IL-15 linked to a drug, radionuclide or toxin.

31. A method as claimed in claim 30, wherein the antibody is specific for a cell marker specific to a B-cell.

32. A method as claimed in claim 30, wherein the antibody is specific for a cell marker specific to a malignant B-cell.

33. A method as claimed in claim 30, wherein the antibody is specific for a cell marker specific to an activated B-cell.

34. A method as claimed in claim 30, wherein the antibody is specific for a cell marker specific to a normal B-cell.

35. A method as claimed in claim 30, wherein the antibody is specific for a cell marker specific to a T-cell.

36. A method as claimed in claim 30, wherein the antibody is specific for a cell marker specific to a malignant T-cell.

37. A targeting moiety comprising a conjugate of an antibody linked to a ligand-binding region of interleukin-13 receptor  $\alpha$  (IL-13R $\alpha$ ), which antibody is specific to HLA-DR.

38. A composition comprising a targeting moiety according to claim 18, and a pharmaceutically acceptable carrier.